Powerlink Queensland

Summary of Project Assessment Conclusions Report

6 September 2023

Addressing the secondary systems condition risks at Tangkam

Summary

Tangkam Substation is located approximately 30km north west of Toowoomba. The site was established in 1999 as part of the Oakey Gas Turbine Power Station connection. Planning studies have confirmed there is a long-term requirement to continue to supply the existing electricity services provided by Tangkam Substation.

The secondary systems at Tangkam broadly perform the functions of transmission element protection, data collection, and remote and local control and monitoring. The majority of Tangkam's secondary systems are nearing the end of their technical service lives and are increasingly at risk of failure, with many items of equipment no longer supported by the manufacturers and limited spares available.

Increasing failure rates, along with the increased time to rectify faults due to the obsolescence of the equipment, significantly affects the availability and reliability of these systems and their ability to continue to meet the requirements of the National Electricity Rules (the Rules).

Powerlink must therefore address the emerging risks arising from the condition of the secondary systems at Tangkam Substation. As the identified need for the proposed investment is to meet reliability and service standards specified within Powerlink's Transmission Authority, guidelines and standards published by the Australian Energy Market Operator (AEMO), and Powerlink's ongoing compliance with Schedule 5.1 of the Rules, it is classified as a 'reliability corrective action'[1].

This Project Assessment Conclusions Report (PACR) represents the final step in the Regulatory Investment Test for Transmission (RIT-T) process prescribed under the Rules, undertaken by Powerlink to address the condition risks arising from the secondary systems at Tangkam Substation. It contains the results of the planning investigation and the cost-benefit analysis of credible options compared to a non-credible Base Case where the emerging risks are left to increase over time. In accordance with the RIT-T, the credible option that maximises the present value of net economic benefit, or minimises the net cost, is recommended as the preferred option.

Credible options considered

Powerlink has developed three credible network options to maintain the existing electricity services, ensuring a reliable, safe and cost effective supply to customers in the area. The major difference between the credible options relates to whether to stage replacement of the secondary systems or perform a complete replacement of the secondary systems.

By addressing the condition risks, all options allow Powerlink to meet the identified need and continue to meet the reliability and service standards specified within Powerlink's Transmission Authority, Schedule 5.1 of the Rules, AEMO guidelines and standards and applicable regulatory instruments.

Powerlink Published a Project Specification Consultation Report (PSCR) on 4 October 2022 to address the risks and obsolescence issues arising from the condition of the secondary systems at Tangkam Substation. No submissions were received in response to the PSCR that closed on 6 January 2023. As a result, no additional credible options have been identified as a part of this RIT-T consultation.

The three credible network options, along with their NPVs relative to the Base Case are summarised in Table 1. The absolute NPVs of the Base Case and the Options are shown graphically in Figure 1. All options have a negative NPV relative to the non-credible Base Case, as allowed for under the Rules for 'reliability corrective actions'. Of the credible network options, Option 2 has the highest NPV relative to Base Case.

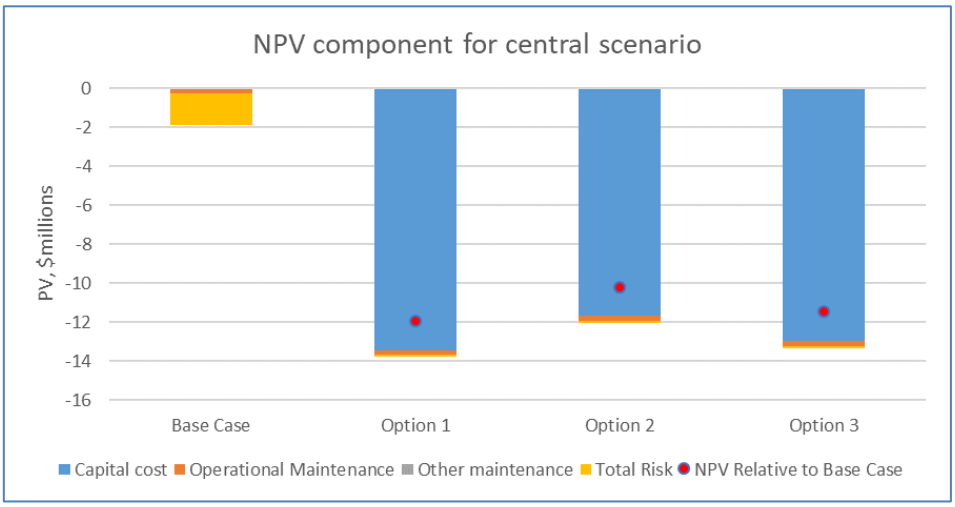
[1] The Rules clause 5.10.2, Definitions, reliability corrective action.

Table 1: Summary of credible network options

Option	Description	Total costs ($m, 2023)	NPV relative to Base Case ($m, 2023)	Ranking
1	Staged replacement of selected 110kV secondary systems into a new- demountable building by June 2025 Replacement of the remaining bays by June 2028	19.7	-11.9	3
2	Single stage replacement of all 110kV secondary systems into a new demountable building by June 2025	14.6	-10.2	1
3	Single stage replacement of all 110kV secondary systems into the existing building by June 2025	16.2	-11.5	2

The absolute NPVs of the Base Case and the credible options are negative, shown graphically in Figure 1, with Option 2 being the least negative of the credible options. All options reduce the risk cost arising from the condition of the ageing and obsolete secondary systems at Tangkam Substation remaining in service, enabling Powerlink to continue to meet reliability and service standards specified within its Transmission Authority. They also ensure Powerlink's ongoing compliance with Schedule 5.1 of the Rules and guidelines and standards published by AEMO.

Figure 1: NPV of Base Case and Credible Network Options



Evaluation and Conclusion

The RIT-T requires that the preferred option maximises the present value of net economic benefit, or minimises the net cost, to all those who produced, consume and transport electricity. The cost benefit analysis demonstrates that Option 2 provides the least net economic cost in NPV terms and is therefore the preferred option.

In accordance with the expedited process for the RIT-T, the PSCR made a draft recommendation to implement option 2, which involves the full secondary systems replacement with new panels in a new building by 2025. The indicative capital cost of this option is $14.6 million in 2022/23 prices. Under Option 2, initial design work will commence in early 2024, with installation and commissioning of the new secondary systems now completed by June 2025.

As the outcome of the cost benefit analysis contained in this PACR and identification of the preferred option remains unchanged from that published in the PSCR, the draft recommendation has been adopted as the final recommendation, and will now be implemented.

Dispute Resolution

In accordance with the provision of clause 5.16B(a) of the NER, Registered Participants, the AEMC, Connection Applicants, Intending Participants, AEMO and interested parties may, by notice to the AER, dispute conclusion in this report in relation to:

- the application of the RIT-T
- the basis upon which the preferred option was classified as a reliability corrective action, or
- the assessment of whether the preferred option has a material inter-regional impact or not.

Notice of a dispute must be given to the AER within 30 days of the publication date of this report. Any parties raising a dispute are also required to simultaneously provide a copy of the dispute notice to the RIT-T proponent.

Contact us

Registered office	33 Harold St Virginia Queensland 4014 Australia
Postal address:	GPO Box 1193 Virginia Queensland 4014 Australia
Contact:	Roger Smith Manager Network and Alternate Solutions
Telephone	(+617) 3860 2111 (during business hours)
Email	networkassessments@powerlink.com.au
Internet	www.powerlink.com.au